



US009636625B2

(12) **United States Patent**
Gless

(10) **Patent No.:** **US 9,636,625 B2**
(45) **Date of Patent:** **May 2, 2017**

(54) **DRYING DEVICE AND BATTERY SYSTEM
AND MOTOR VEHICLE HAVING SAID
DRYING DEVICE**

(58) **Field of Classification Search**
None
See application file for complete search history.

(75) Inventor: **Michael Gless**, Stuttgart-Zazenhausen
(DE)

(56) **References Cited**

(73) Assignees: **Robert Bosch GmbH**, Stuttgart (DE);
Samsung SDI Co., Ltd., Yongin-si,
Gyeonggi-do (KR)

U.S. PATENT DOCUMENTS

2003/0170535 A1* 9/2003 Watanabe H01M 2/0207
429/158
2009/0060751 A1* 3/2009 Bourell, Jr. F04D 15/0218
417/36

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 457 days.

(Continued)

FOREIGN PATENT DOCUMENTS

(21) Appl. No.: **14/125,387**

CN 1184063 A 6/1998
CN 1378636 A 11/2002

(22) PCT Filed: **Jun. 4, 2012**

(Continued)

(86) PCT No.: **PCT/EP2012/060493**

§ 371 (c)(1),
(2), (4) Date: **Mar. 28, 2014**

OTHER PUBLICATIONS

English translation of DE 102008034698 A1.*

(87) PCT Pub. No.: **WO2012/171822**

PCT Pub. Date: **Dec. 20, 2012**

(Continued)

(65) **Prior Publication Data**

US 2014/0199566 A1 Jul. 17, 2014

Primary Examiner — Scott J Chmielecki
(74) *Attorney, Agent, or Firm* — Maginot, Moore & Beck
LLP

(30) **Foreign Application Priority Data**

Jun. 14, 2011 (DE) 10 2011 077 489

(57) **ABSTRACT**

(51) **Int. Cl.**
H01M 10/50 (2006.01)
B01D 53/04 (2006.01)

(Continued)

(52) **U.S. Cl.**
CPC **B01D 53/0415** (2013.01); **B01D 53/261**
(2013.01); **H01M 2/10** (2013.01);
(Continued)

A drying device includes a desiccant cartridge having a desiccant to reduce a moisture content of a gas located in an inner chamber of a housing. The drying device has a protective chamber which is configured to be introduced into the housing in a liquid-tight manner with respect to the inner chamber and which is connected to the internal space in a gas-conducting manner. The desiccant cartridge is arranged in the protective chamber. A battery system includes the drying device and a motor vehicle includes the battery system.

18 Claims, 3 Drawing Sheets

